

[54] LATCH AND RETURN SPRING

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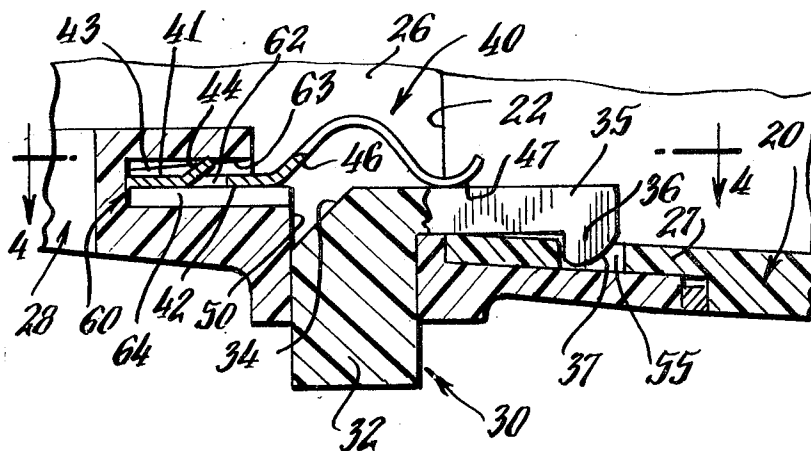
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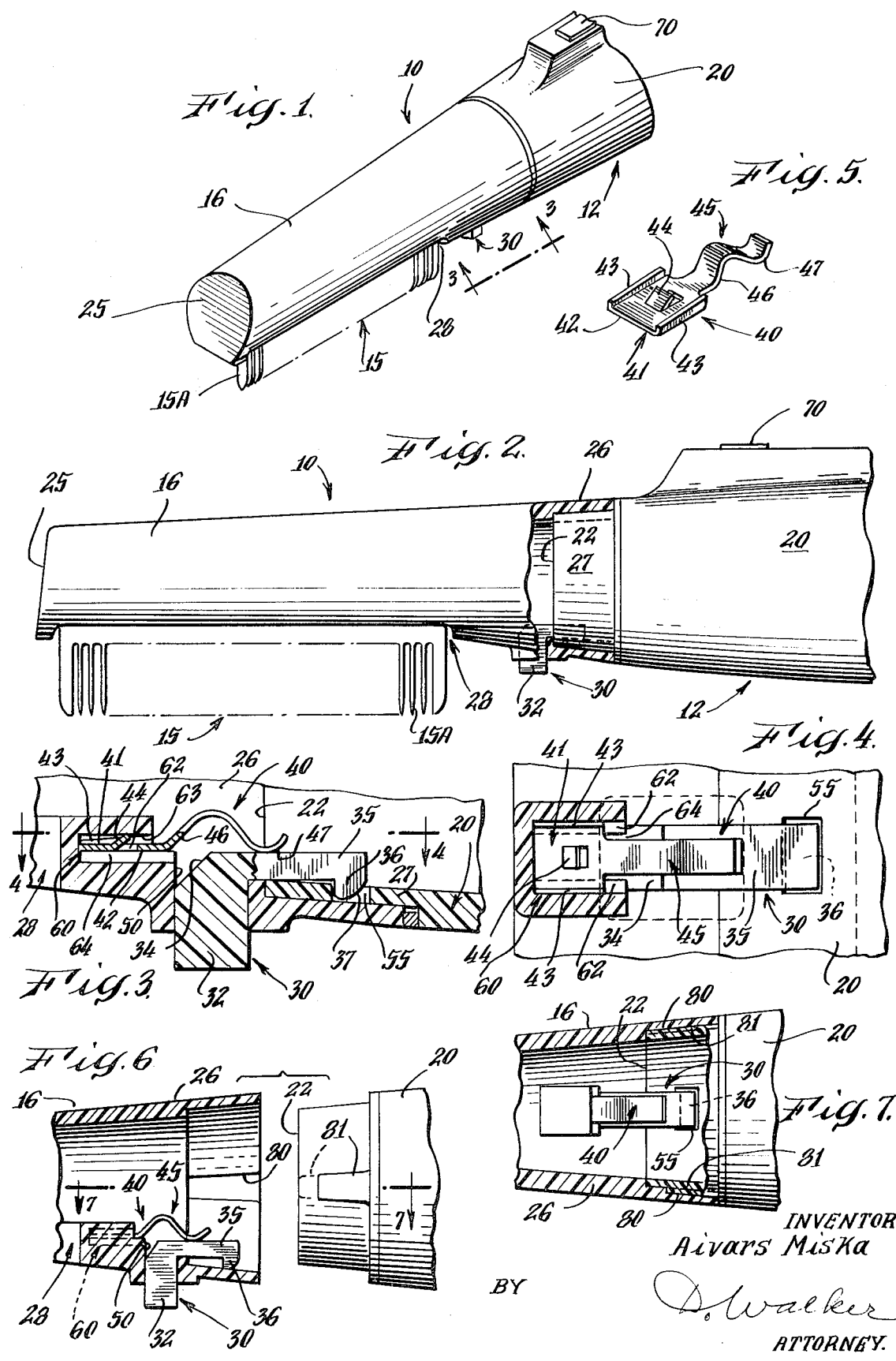
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[57] ABSTRACT

Apparatus for separably connecting a portable source of supply of hot air and a hair grooming implement holder together, wherein the source includes a housing, and the holder includes a housing adapted to carry a hair grooming implement and guide hot air from the source laterally of the the implement. The connecting apparatus comprises: an L-shaped latch, one leg of which is slidably mounted in a passageway formed in one of the housings, and the other leg of which is positioned to internally overlap a portion of the other housing when the housings are brought together for connection; a leaf spring connected to the one housing to contact the latch for resiliently loading the latch in the passageway; and a keeper cavity formed in the other housing for receiving the other latch leg. The spring resiliently loads the latch for forcing the other latch leg into the cavity to connect the housings together, and the latch is manually movable against the spring load to enable the housings to be separated. Also, the spring acts as a stop to limit the travel of the latch so as to prevent the spring from being overstressed.

8 Claims, 7 Drawing Figures





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LATCH AND RETURN SPRING

BACKGROUND AND SUMMARY OF THE INVENTION

This invention is concerned with apparatus for 5
seperably connecting the hand held housing of a portable source of supply of hot air, within which a heating element and motor driven fan are mounted with provision for connecting them to a supply of electrical power, and a hair grooming implement holder which is constructed and arranged for carrying a hair grooming implement.

Connecting devices for temporarily joining the various components of a consumer product which is assembled for use, and disassembled thereafter, are a recurring source of product failure. The parts of the device, such as their latches and/or springs are apt to be the first parts of the product to fail due to repeated mishandling. For example, many consumer products include a latch resiliently loaded by a spring, in an arrangement in which the spring may be over-stressed due to the latch being casually manipulated.

To solve the problem some manufacturers have been heavily spring loading the latches to prevent excessive motion, while others have been capturing the latches in compartments within the components with which they are associated so that the components act as mechanical stops to prevent the latches from over-traveling. The first solution calls for a heavy and thus expensive spring; and the second, a complex, and thus expensive, mode of housing the latch in its associated component. In addition, the first solution provides a stiffly movable latch, and the second, a latch which is likely to rattle within the housing.

To solve this problem I have provided a light spring and associated it with the latch such that the spring acts as a stop to prevent the latch from overstressing the spring. The latch is slidably mounted in a passageway for ease of manual manipulation.

The invention is in apparatus for separably connecting a portable source of supply of hot air and a hair grooming implement holder together, wherein the source includes a housing, and the holder includes a housing adapted to carry a hair grooming implement and guide hot air from the source laterally of the implement. The connecting apparatus comprises: an L-shaped latch, one leg of the latch slidably mounted in a passageway formed in one of the housings, and the other leg internally overlapping a portion of the other housing when the housings are brought together for connection; a leaf spring connected to the one housing and contacting the latch for resiliently loading the latch in the passageway and acting as a stop to limit travel of the latch; the other housing having a keeper cavity formed therein for receiving the other latch leg, the spring resiliently loading the latch for forcing the other latch leg into the cavity to connect the housings when they are brought together, and the latch manually movable against the spring loading to enable the housings to be separated.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of apparatus embodying the invention;

FIG. 2 is an enlarged side elevation of the apparatus of FIG. 1, carrying a hair grooming implement;

FIG. 3 is an enlarged fragment of FIG. 1, taken substantially along the line 3—3 of FIG. 1;

FIG. 4 is a view of FIG. 3 taken substantially along the line 4—4 of FIG. 3;

FIG. 5 is a perspective view of the latch spring;

FIG. 6 is an enlarged fragment of FIG. 2; and,

FIG. 7 is a view of FIG. 6 taken substantially along the line 7—7 of FIG. 6.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings, wherein like reference numerals designate like or corresponding parts throughout the several views, the connecting apparatus 10, is shown cooperatively associated with a portable source of supply of hot air, 12, and a hair grooming implement holder, 15, of the type which includes a housing, 16, having means for removably connecting a hair grooming implement, 15A, thereto.

In arrangements of the type shown, the source of supply of hot air, 12, is a hand held unit which generally includes an open-ended housing, 20, within which an electrically energizable fan and air heating element are mounted with provision for connecting them to a source of supply of electrical power. One of the open ends of the housing acts as the air inlet into the unit, and the other, the air outlet, 22. When energized, ambient air is carried into the heating unit's housing by the fan, heated by the heating element in transit through the housing, and discharged through outlet 22.

The implement holder, 15, is removably connectable to the outlet, 22, for replacement and cleaning purposes. As shown in FIGS. 1 and 6, the holder's housing, 16, has an arcuately-shaped cross-section throughout most of its longitudinal length and has one end terminated by a wall, 25. The other end forms a conduit, 26. The conduit, and the portion, 27, of the heating unit's housing which forms the outlet, 22, are shaped to have mating surfaces of complementary configuration, and are preferably connected together by means of the connecting apparatus, 10. To promote the flow of hot air from the heating unit into close proximity with hair grooming implement, the holder's housing partially encloses the hair grooming implement. The housing forms a longitudinally extending recess, 28, within which the grooming implement is mounted. When connected to the heating unit for use, the implement holder's housing acts as an extension of the housing of the heating unit. Since the wall, 25, closes the free end of the holder's housing, the housing tends to direct the hot air laterally of the length of the implement as back pressure develops in the air stream due to the presence of wall. One or more state of the art air-deflectors may be connected to the holder, within the recess, to promote this effect. In operation, hot air from the heating unit thus enters the holder through its rearward end, 26, and flows to the grooming implement through recess 28, exiting the holder's housing directed towards the user's hair.

The connecting apparatus, 10, preferably includes a portion of the housing of the hair grooming implement holder; an L-shaped latch, 30; a spring 40; and a portion of the housing of the source of supply of hot air.

As shown in FIGS. 3 and 4, the latch, 30, has one leg, 32, which is vertically oriented and slidably mounted in

a passageway, 50. The passageway is formed in the conduit portion, 26, of the housing of the hair implement holder. Leg 32 has its upper end provided with a surface, 34, which is formed at an angle of approximately 45° with respect to the longitudinally extending axis of that leg. The other leg of the latch, leg 35, extends horizontally from the aforesaid leg for internally overlapping a portion of the housing of the hot air source, when the housings of the holder and source are brought together for connection, as shown in the Figures. The free end of leg 35 is terminated by a downwardly extending finger portion, 36, having a curved outwardly facing surface, 37.

As shown in FIGS. 3-5, the spring includes U-shaped body portion, 41, and arm portion 45. The body portion has a base section, 42, from which its opposed leg sections, 43, upwardly extend; and is provided with a tab, 44, extending upwardly from its center and at an angle of approximately 45° with respect to the base section. The arm portion of the spring is of S-shaped construction. It initially extends upwardly from the base at an angle of approximately 45° with respect to the base, to form a flat, downwardly facing, surface, 46; then curves downwardly through an arc of approximately 90°, to extend downwardly at an angle of approximately 45° with respect to the base, and then upwardly through another arc of approximately 90° to form a curved, downwardly facing, surface, 47.

Normally the spring resiliently loads the latch downwardly in the position shown in FIG. 3. The downwardly facing curved surface, 47, of the arm of the spring slidably contacts the upper surface of leg 35 of the latch for resiliently loading the latch in the passageway, 50. When the housings of the hair implement holder and hot air source are brought together, the spring forces the finger portion, 36, of the latch leg, 35, into an internally located keeper cavity, 55, which is formed in portion 27 of the hot air source's housing for receiving the finger portion to connect the housings together. To enable the housings to be separated, leg 32 of the latch is slidably moved upwardly within its associated passageway thereby removing the finger portion of leg 35 from its associated cavity, 55.

As shown in FIGS. 3 and 4, the body portion, 41, of the spring is connected to the hair implement holder's housing. The latter has pocket, 60, within which the body portion of the spring is receivable. When the spring is inserted into the pocket the sides of the base, 42, i.e., the portion of the base from which legs 43 upwardly extend, contact the opposed ledges, 62, formed within the cavity. The ledges force the free end of the tab, 44, against the upper wall, 63, of the cavity, whereupon the base of the spring is deflected slightly downwardly into recess, 64. This causes the tab to be resiliently forced against the wall to anchor the spring within the pocket.

With the spring connected to the housing of the hair grooming implement as hereinbefore described, it cannot be easily removed, since the tab will dig into the upper wall of the pocket if removal is attempted. As shown in FIG. 3, the latch surface, 34, is oriented substantially parallel with respect to the spring surface, 46. If the latch is moved upwardly a sufficient distance, these surfaces will of course contact one another. Normally, such contact does not occur since the latch,

need not be forced into contact with surface 46 of the spring to lift the finger portion of the latch from the keeper cavity, to allow the housings to be separated from one another. In the event that surfaces 34 and 46, are brought into contact, latch travel is stopped by surface 46 of the spring. Accordingly, the spring acts as a stop for limiting latch travel, to prevent the spring from being overstressed.

Of course when the housings are brought together for connection, the outlet end of the heating unit's housing is forced against surface 37 of the latch, to lift the latch upwardly against the force of the spring; and the finger, 36, snaps into the recess, 55, to join the heating unit and hair implement holder together.

As shown in FIG. 2, portions 26 and 27 of the housings form an air tight connection with one another. Normally it is desirable to locate the actuating switch, 70, of the heating unit, 180° from the latch, so that the latch is not inadvertently manipulated during the course of using the apparatus. Also, it is desirable to have the comb protruding from the holder 180° from the actuating switch, 70, so that the user may easily manipulate the switch without touching the hair grooming implement. Of course, it is also desirable that the housings be properly oriented with respect to one another when they are brought together for connection, to avoid damaging the latch. And, it is desirable to connect the housing together with sufficient rigidity to prevent them from rotating relative to one another and perhaps damaging the latch when the hair grooming implement is in use.

With these considerations in mind it is an added feature of the invention to combine the above described latch and spring arrangement with means for fixedly orienting the housings relative to one another during use of the apparatus. As shown in FIGS. 6 and 7, for this purpose there is provided opposed channels, 80, in the inner surface of one of the housings, and opposed keys, 81, on the outer surface of the other housing. As shown in FIG. 7 one of the key-channel pairs is of lesser longitudinal length than the other. With this arrangement the housing cannot be joined together until the housings are oriented relative to one another so as to allow the longer of the two keys to be inserted in the longer of the two channels, and the shorter key to be inserted in the shorter channel. Of course the arrangement automatically orients the latch and keeper cavity in proper relationship to one another for connecting the housing's together.

What is claimed is:

1. Apparatus for separably connecting a portable source of supply of hot air and a hair grooming implement holder together, the source including a housing, and the holder including a housing adapted to carry a hair grooming implement and guide hot air from the source laterally of the implement, the connecting apparatus comprising:

- a. a manually operable L-shaped latch, one leg of the latch slidably mounted in a passageway formed in one of the housings, the other leg of the latch internally overlapping a portion of the other housing when the housings are brought together for connection,
- b. a flat spring of the cantilever type, the spring having a body portion and an arm portion, the body

portion connected to the one housing and the arm portion extending internally thereof, the spring arm portion contacting the latch and resiliently loading the latch to exert a force thereon, said spring force constraining travel of the one latch leg to travel thereof within the passageway, and

- c. the other housing having a keeper cavity formed therein for receiving the other latch leg, said spring force urging the other latch leg into said keeper cavity to connect the housings when they are brought together, and the one latch leg extending from the passageway for operating the latch against said spring force to thereby slidably move the one latch leg within the passageway and move the other latch leg out of the cavity to enable the housings to be separated.

2. The apparatus according to claim 1, including the one housing having an internal pocket formed therein for receiving the spring body portion, the pocket including walls, the spring body portion having a base section with a tab extending therefrom which contacts a wall of the pocket to anchor the base section within the pocket.

3. The apparatus according to claim 1, wherein the spring body portion includes a base section, and the spring arm portion extends from the base section and is curved through successive arcs of approximately 90° to provide the arm portion with an S-shaped configuration.

4. The apparatus according to claim 1, wherein each of the housings has an end portion forming a conduit, said conduits being of complementary configuration to fit together when the housings are connected, and said conduits respectively including means for preventing relative rotation between the housings when the housings are connected.

5. The apparatus according to claim 1, including

means for aligning the latch and keeper cavity relative to one another for connecting the housings together, the aligning means including a channel in one of the housings and a key on the other of the housings, the key and channel relatively dimensioned to fit together when the housings are brought together for connection, and the latch and keeper cavity being properly aligned for connecting the housings when key and channel are aligned to fit together.

6. The apparatus according to claim 1, including the latch leg which overlaps the other housing having a finger portion, the finger portion including a surface, said other housing slidably contacting said finger surface to move the latch against said spring force when the housings are initially brought together for connection, the finger surface slidably contacting said overlapped portion of the other housing as the housings are being brought together for connection, and the finger portion being urged by said spring force into the cavity for connection of the housings.

7. The apparatus according to claim 1, wherein the spring arm portion includes a surface which overlaps a portion of the one latch leg, the overlapped portion of the one latch leg has a cutout opposite said spring surface, and the overlapped portion of the one latch leg contacts the spring surface when the one latch leg is excessively moved within the passageway, said spring surface thus restraining movement of the one latch leg to movement thereof within the passageway.

8. The apparatus according to claim 1, wherein said keeper cavity includes a portion of each of the housings, the cavity portion of said other housing including an aperture formed therein, the aperture having an opening at each of the ends thereof, and the cavity portion of said one housing including an internal wall portion thereof which closes one of the aperture openings when the housings are connected.

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